

sified as patients with a detectable level of HBV DNA and undetectable HBV DNA ( $<1.08$  log copies/ml). The mutations associated with HBV drug resistance were investigated in patients with detectable HBV DNA. Due to resistance, in this group of patients treatment was change.

**Results:** In our study group, four patients developed LAM-associated mutations (rtL180M+rtM204V, rtL180M+rtM204V/I, and 2 present rtM204I), three patients developed ADV-associated mutations (rtA181V+rtN236T; rtN236T and rtA181V), one patient developed ADV+LAM associated mutations (rtL180M+rtA181V+rtN236T) and other patient developed ETV-associated mutations (rtL180M+rtT184A+rtS202G+rtM204V). Beside the primary resistant mutations, various combinations of secondary and compensatory mutations conferring resistance to nucleos(t)ide analogues were detected in 5 (33%) patients.

**Conclusion:** HBV treatment with nucleoside analogues results in the development of mutants strains, leading to drug resistance. These data suggest an early development of ETV resistance in patients with prior LAM and ADV resistance. Therefore genotypic resistance is important in monitoring HBV treatment. In conclusion, optimization of therapy combining LAM and ADV may be a good choice for patients with hepatitis B who have resistance mutations to ADV or LMV.

doi:10.1016/j.ijid.2010.02.2008

53.027

#### Long term virological follow up of Hepatitis C (VHC) monoinfected patients who achieved end of treatment response (ETR)

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**Background:** Over the last few years a new concept has introduced a possibility a SVR may indicate cure. VHC-ARN clearance at 6 months after therapy discontinuation SVR (sustained virologic response) is generally assumed as probable cure. The medical literature shows a significant reduction in the rate of progression to cirrosis and Hepatocarcinoma development in patients who achieved SVR compared to non responders and relapsers.

**Methods:** We retrospectively analysed a group of VHC patients that fulfilled histologic criteria for antiviral treatment from 1998 to 2009. We performed VHC ARN PCR determinations at baseline, during treatment, in the last week of antiviral treatment, every 6 months' until the 2<sup>o</sup> year after therapy discontinuation. and once a year further on. We defined ETR as negative or undetectable ARN VHC PCR in the last week of antiviral treatment.

**Results:** In our study 38 patients achieved ETR (negative VHC PCR during the final week of IFN treatment). Only

SVR). The rest of the patients are not detectable up to the last control., in the long term follow up.

**Conclusion:** In this small group of patients we didn't find relapses after 6 months following discontinuation of therapy, with a mean follow up of nearly 10 years The period of highest risk of relapses was the next 12 months after the end of treatment. The rate of relapses after 24 months of the end of treatment was very low, as estimated in different studies between 1 and 2%.

doi:10.1016/j.ijid.2010.02.2009

53.028

#### Seroprevalence of hepatitis A among children and adolescent from south and southeast region of Brazil

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**Background:** The objectives were to estimate the prevalence of hepatitis A among children and adolescents from south and southeast region of Brazil and to identify individual-, household- and area-levels factors associated with hepatitis A infection.

**Methods:** This population-based survey was conducted in 2007–2008 and covered individuals aged between 5 and 19 years. A stratified multistage cluster sampling technique with probability proportional to size was used to select 5,054 individuals aged between 5 and 19 years living in the State capitals of 7 states in the study regions. The sample was stratified according to age (5–9 and 10- to 19-years-old) and capital within each region. Individual- and household-level data were collected by interview at the home of the individual. Variables related to the area were retrieved from census tract data. The outcome was total antibodies to hepatitis A virus detected using commercial EIA. The associations between HAV infection and independent variables were assessed using the odds ratio and corrected for the random design effect and sampling weight. Multilevel analysis was performed by GLLAMM using Stata 9.2.

**Results:** The prevalence of hepatitis A infection in the 5–9 and 10–19 age-group was 20,6 and 37,7%, respectively for the Southeast and, 18,9 and 34,5%, respectively for the South. A trend for the prevalence of HAV infection to increase according to age was detected in all sites. Multilevel modeling showed that variables relating to different levels of education were associated with HAV infection in all sites. The multilevel model showed that individual, household- and area-level variables are independently associated with HAV infection. Age is an important predictor of

outcome. Additionally, education and sewage disposal service variables that were collected through household-level interviews or retrieved from IBGE census tract data were associated with HAV infection in all sites.

**Conclusion:** The study sites were classified as areas with low endemicity area for hepatitis A infection. This multilevel model allowed for quantification of contextual predictors of hepatitis A infection in urban areas.

doi:10.1016/j.ijid.2010.02.2010

53.029

# **Household survey of hepatitis B infection and risk factor assessment in the from South and Southeast region of Brazil**

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**Background:** In 1989, the Brazilian government first implemented immunization against hepatitis B for infants and children in the western Amazon region and gradually expanded this to other regions. Vaccination of risk groups for the whole country started in 1992, and new groups have been successively added to the original list. Since 1998, the HBV vaccine has been incorporated into the immunization schedule for infants as a national policy and, in 2001, this was broadened to include children and adolescents. Ppopulation-based survey was conducted in Brazil to estimate the prevalence of and risk factors for HBV infection from South and Southeast region of Brazil.

**Methods:** Random multistage cluster sampling was used to select individuals aged 13-69 years. Outcomes indicating HBV infection were anti-HBc and HBsAg. HBsAg-positive samples were tested for HBV-DNA and genotyped. Univariate and multivariate analyses were performed.

**Results:** Overall, 10,496 individuals were included; the prevalence of anti-HBc was: South 1,58% for 10-19 and 11,3 for 20-69 years old; Southeast 0,61% for 10-19 and 7,9 for 20-69 years old. HBsAg positivity was less than 0,5% in all areas. Genotypes 3A, 1b, 1a and 2b were identified. Age were associate with HBV infection in all region and male were independently associated with HBV infection in Southeast.

**Conclusion:** Our survey classified the South and Southeast region of Brazil as low HBV endemicity areas. Our findings that age is risk factors for HBV reinforce the need for extensive HBV vaccine coverage among adolescents to prevent viral infection. All individuals belonging to the risk groups identified by our survey should be considered candidates for HBV vaccine and educational measures. Therefore, vaccination upon request for individuals without specific risk should be considered, in accordance with the current CDC recommendations. This survey shows the importance of generating

population-based information to facilitate comprehensive vaccination and of developing educational strategies that address regional differences.

doi:10.1016/j.ijid.2010.02.2011

53.030

# **Age-dependent, differentiated prevalence of anti-HAV and anti-HBc antibodies among patients with chronic hepatitis C (CHC): New aspect of future vaccination perspectives against hepatitis A Virus**

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**Background:** Hepatitis A is an acute, usually self-limiting disease of the liver, caused by hepatitis A virus. Patients with chronic liver disease are at increased risk of severe complications, related to hepatitis A, which, in some circumstances, may even lead to death. Therefore, it is postulated that HAV susceptible individuals (anti-HAV seronegative subjects) should be vaccinated against HAV to prevent or diminish morbidity and mortality of the disease. Aim: Evaluation of the prevalence of anti-HAV antibodies among patients in different age groups with chronic hepatitis C.

**Methods:** 133 patients (the mean age: 38.3 yrs) with CHC were divided into two groups, according to age (Table 1). The control group consisted of 150 healthy young medical students (the mean age: 25.3 yrs). The presence of anti-HAV and addition of HBV infection viral markers: anti HBc and HBsAg in blood sera of the patients and of the control group were assessed, using the standard EIA method (Cobas Roche).

**Results:** The prevalence of anti HAV antibodies and HBV infection markers among the evaluated groups are presented in Table 1.

Group	Age years	Pt n	anti HAV		Anti-HBc		HBsAg	
			n	%	n	%	n	%
CHC	18-30	33	5	15.5	6	18.8	0	0
	31-73	100	47	47.0	27	27.0	2	2
Control	150	15	10.0	8	5.3	2	1.33	
24-26								

In the study groups, age-dependent, differentiated prevalence of anti-HAV and anti-HBc was observed among younger (< 31 years) and older (> 30 years) patients with CHC (15.5% vs. 47.0%;  $p = 0.05$  and 18.8% vs. 27%,  $p = 0.05$ , respectively), which was higher than in healthy controls (10.0% and 5.3%, respectively).

**Conclusion:** Patients below 31 with CHC present significantly lower anti-HAV and anti-HBc prevalence than older ones, what creates a substantial risk for fulminant liver failure and even death in case of HAV or HBV infection. Thus vaccination programmes against HAV and HBV are strongly recommended in these groups of patients.

doi:10.1016/j.ijid.2010.02.2012